



Safety instruction. Hydrogen H₂



Hydrogen H₂ (Industrial)

Features Hydrogen is a colourless, odourless and tasteless gas. It is the lightest gas known. Hydrogen ignites very sensitively and burns with a hot, almost invisible flame. Hydrogen is not toxic, but in high concentrations it is suffocating.

Risk of fire and explosion Hydrogen has a high energy content and, when combined with air or oxygen and ignited, releases large amounts of heat energy. The ignition limits in air, at atmospheric pressure, are 4-75%. When discharged, high-pressure hydrogen may spontaneously ignite without an obvious ignition source. It is therefore important to direct hydrogen blasts, including from shut-off and cylinder valves, to a safe location away from people and equipment. Due to the risk of spontaneous combustion, the cylinder valve must not blow gas without a pressure regulator.

Ignition sources Ignition sources do not always have to be known and common, such as smoking, open flames and sparking work, but hot surfaces above +550°C, static sparks or sparks from electrical appliances can also ignite a hydrogen fire. Sparking must be eliminated by proper earthing of hydrogen equipment and buildings and by selecting Ex-proof electrical equipment suitable for hydrogen.

Choice of material Hydrogen penetrates through certain materials, which are leak-proof when using air or other gases. Materials suitable for hydrogen include stainless steel, carbon steels, copper and its alloys. The use of cast iron pipes and fittings is not recommended. Hydrogen embrittlement can occur on certain grades of steel. For this reason, the steels used must be suitable for hydrogen service.

Connections Permanent joints (i.e. welded or soldered) are recommended to reduce leakage. Flange and threaded joints should be avoided. Use a leak detection spray to find leaks.

Prohibition of use Hydrogen may not be used to inflate balloons (Decree 109/73).

Fire protection Hydrogen burns with an almost invisible flame and is very difficult to extinguish. The most effective way to extinguish a hydrogen fire is to shut off the source of the hydrogen, if it can be done safely. If the leak cannot be stopped, the hydrogen fire should not be extinguished, as leaking hydrogen can cause an explosion if it reignites.

What to do in an emergency

- alert the fire department
- evacuate people from the danger zone
- if possible and safe, close the hydrogen supply valves
- deny access to unauthorised persons
- ask your gas supplier for further advice